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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/692,954	10/24/2003	Chih-Ching Yu	90167	2009

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EXAMINER

RIVERO, MINERVA

ART UNIT PAPER NUMBER

2627

DATE MAILED: 06/27/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/692,954

Applicant(s)

YU, CHIH-CHING

Examiner

Minerva Rivero

Art Unit

2627

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 24 October 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-5 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)               | Paper No(s)/Mail Date. _____  |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                                    |

## DETAILED ACTION

### *Priority*

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

### *Claim Rejections - 35 USC § 102*

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1 and 3<sup>4</sup> are rejected under 35 U.S.C. 102(b) as being anticipated by Okamoto (US 6,052,349).

4. Regarding claims 1 and 3, Okamoto discloses a signal equalizer for an optical storage medium for detecting a restoring signal from the medium and equalizing a digital signal in the restoring signal into an optimized signal for data detections (Col. 6, Lines 54-63), the signal equalizer comprising:

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an adaptive linear equalizer, which performs a linear equalization on the digital signal and outputs a target wave and an error signal (Col. 4, Lines 56-59; Col. 10, Lines 16-17); and

a nonlinear distortion cancellation equalizer, which takes the error signal as the target level of the nonlinear distortion cancellation equalizer and performs a nonlinear distortion cancellation according to an estimated nonlinear signal (Col. 4, Lines 56-63).

5. Regarding claim 4, Okamoto discloses a first adder to sum up the outputs of the adaptive linear equalizer and the nonlinear distortion cancellation equalizer (*composite equalizer comprising a linear and a nonlinear equalizer*, Col. 9, Lines 53-59).

### ***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2,5  
7. Claims ~~1-5~~ are rejected under 35 U.S.C. 103(a) as being unpatentable over Okamoto, in view of Tsujimoto (US 5,119,401).

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8. Regarding claims 2 and 5, Okamoto does not explicitly disclose but Tsujimoto does disclose the nonlinear distortion cancellation equalizer further containing a second adaptive linear equalizer and an adder, wherein the output of the second adaptive linear equalizer is fed back to the adder for the adder to output a second error signal according to the error signal and the feedback signal as a nonlinear input signal for the second adaptive linear equalizer (Col. 4, Lines 9-33; *output of adder is fed back to subtractor*, Col. 5, Lines 34-60, see Fig. 5).

Therefore it would have been obvious to one ordinarily skilled in the art at the time of the invention to supplement the teachings of Okamoto and have the nonlinear distortion cancellation equalizer contain a second adaptive linear equalizer and an adder, wherein the output of the second adaptive linear equalizer is fed back to the adder for the adder to output a second error signal according to the error signal and the feedback signal as a nonlinear input signal for the second adaptive linear equalizer, as disclosed by Tsujimoto, in order to adaptively update the error signal.

### **Conclusion**

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Okamoto *et al.* (US 6,385,239) disclose an adaptive equalizing circuit.

Birru (US 2002/0181575) discloses a decision feedback equalizer.

Lim *et al.* (US 4,615,038) disclose equalization of modulated data signals utilizing replication of nonlinear channel distortion.

Kimoto *et al.* (US 5,434,883) discloses an adaptive equalizer for linear and nonlinear distortion.

Nishida *et al.* (US 6,141,167) discloses an equalizer for a magnetic recording and reproducing apparatus.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Minerva Rivero whose telephone number is (571) 272-7626. The examiner can normally be reached on Monday-Friday 9:00 am - 6:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wayne Young can be reached on (571) 272-7582. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

MR 6/20/06



WAYNE YOUNG  
SUPERVISORY PATENT EXAMINER